Original Article

# Diagnostic Profile of Cardiovascular diseases among patients presented in cardiology outpatient department of a tertiary care centre

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## ABSTRACT

**Introduction:** Cardiovascular diseases (CVDs) are the leading cause of death across the globe. Thirty two percent of all global deaths in 2019 were attributed to CVDs, 85% of which were due to heart attack and stroke; over three quarters of CVD deaths take place in low- and middle-income countries. This study was based on the OPD visits to cardiology department in a central multidisciplinary hospital the results of which would be a gross reflection of what exits in reality at the community level.

**Methods:** It is an OPD-based retrospective observational study. The patients examined in cardiology OPD were enrolled in the study. Demographic profiles of the patients including age, sex and place of residence, diagnosis, co-morbidities, if any and associated CVD risk factors were taken from the medical record maintained in OPD. Ethical clearance was taken from the Institutional Research Board (IRB), National Academy of Medical Sciences, Bir Hospital. Sample size was calculated from the population proportion formula, which came out to be 384. IBM Statistical Package for the Social Sciences (SPSS) version 23 was used for data analysis.

**Results:** A total of 2445 patients were enrolled in the study. Among them 51.5% were female and 48.5% were male. The mean age of the study population was 53.72 +15.69 years. Most of the patients were from Kathmandu valley [76.28%] Maximum number of patients were middle-aged (45 – 64 years) in both genders. Ischemic heart disease (31%), Arrythmia and conduction defects(24%), heart failure (23%) and rheumatic heart disease (4%) were the first four common diseases in CVD spectrum. Hypertension was the most common CVD risk factor (52.3% ) followed by diabetes (8.7%). A significant proportion of patients presented with non-cardiac causes (25.73%). Psychiatric illness, mostly in the form of anxiety and depression, was the most common co-morbidity (6.29%). COPD was the second most common co-morbidity (3.5%) and was predominant in the elderly patients. Renal diseases ranked third in the hierarchy. Orthopedic cases were commonly seen in adult population (5.1%) followed by the elderly (1.8%). Multiple co-morbidities were common in the elderly patients, which were present in 4.6% of their total population. Ischemic stroke was also higher in the elderly (2.4%). Hypothyroidism was far more common among adult females.

**Conclusion:** Ischemic heart disease, arrythmia and conduction defects, heart failure and rheumatic heart disease were the first four common diseases in CVD spectrum. Hypertension was the most common CVD risk factor in our patients. Psychiatric illness in the form of anxiety and depression, COPD, renal diseases and orthopedic issues were the first four common co-morbidities.

**Keyword:** *Co-morbidities, CVDs, Cardiac OPD.*

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## Introduction

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels.[1] They are a set of heterogeneous diseases of which the basic underlying cause of development is most often atherosclerosis.[2] CVD has become the single most important and largest cause of non-communicable diseases(NCD) deaths world- wide, at over 50%.[3] and the estimated deaths are 17.9 million each year.[4] More than four out of five CVD deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under the age of 70 years.[5] Burden of cardiovascular diseases is more in low and middle-income countries(LMIC) compared to high income countries.[6] CVDs constitute the leading causes of mortality and are a major contributor to reduced quality of life in a global perspective.[7] CVD attributed global death is expected to reach 23.6 million by 2030.[8]

The South East Asia Region including India, Pakistan, Bhutan, Bangladesh, Sri Lanka, and Nepal is home to 20% of the world's population and the burdens of CVDs is highest in this region.[9] The prevalence of CVDs differ in different parts of the country. The objective of the study is to identify the prevalence of different diseases in patients presented to cardiology OPD of a tertiary care hospital. The study outcome will help in promulgating scientific recommendations to the concerned authorities for formulating public health strategies aimed at improving CVD risk factors to reduce morbidity and mortality caused by CVD.

## Methods

It was an OPD-based retrospective observational study. The patients examined in cardiology OPD were enrolled in the study. The demographic profile of the patients, clinical diagnosis and co-morbidities were recorded. Study duration was from 1st Baishakh 2078 to last of Chaitra, 2079. Ethical clearance was taken from the Institutional Research Board (IRB), National Academy of Medical Sciences, Bir Hospital [Ref number-61, date-July 6,2023]. IBM Statistical Package for the Social Sciences (SPSS) version 23 was used for data analysis.

## Results

A total of 2445 patients were enrolled in the study. Among them 51.5% were female and 48.5% were male. The mean age of the study population was 53.72 ± 15.69. Most of the patients were from Kathmandu valley [76.28%] (Table: 1).

**Table 1.** Socio-Demographic Characteristics of the patients

| Variables | | Frequency(%) | Mean Age in years |
|---|---|---|---|
| Sex | Male | 1186(48.51) | 53.72± 15.69 |
| | Female | 1259(51.49) | |
| Total | | 2445 | |
| Residence | Kathmandu Valley | 1865(76.28) | |
| | Out of Kathmandu Valley | 578(23.64) | |
| | India | 2(0.1) | |

Maximum number of patients were middle-aged(45– 64 years) in both genders followed by the elderly population (65 years and above). Adolescents were least in number in both genders (Table: 2).

**Table 2.** Age group wise distribution of patient population

| Age Group(in years) | Sex | | Total |
|---|---|---|---|
| | Male | Female | |
| ≤ 18 (Adolescence) | 25 | 10 | 35 (1.4%) |
| 19 – 44 (Adults) | 324 | 302 | 626 (25.6%) |
| 45 – 64 (Middle aged) | 497 | 638 | 1135 (46.4%) |
| ≥ 65 (Elderly) | 340 | 309 | 649 (26%) |
| Total | 1186 | 1259 | 2445 |

Among the cardiovascular diseases, Ischemic heart disease (31%), Arrythmia and conduction defects(24%), heart failure (23%) and rheumatic heart disease (4%) were the first four common entities.

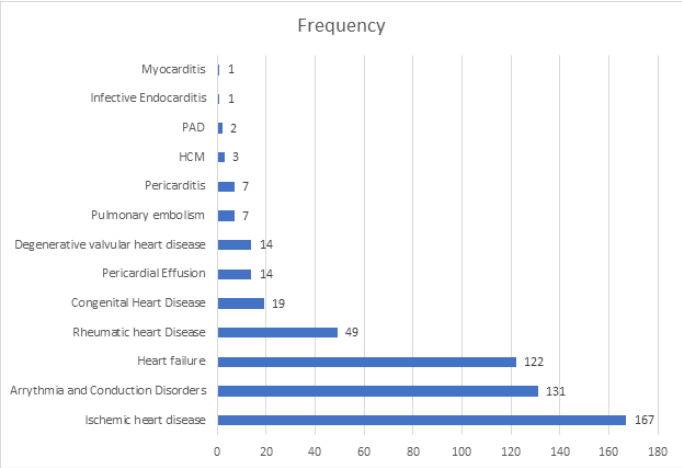


**Fig 1: Distribution of Cardiovascular Diseases among Cases**

Age-wise distribution of diseases shows that most of the CVDs are common among the middle-aged and elderly population.(Table -3). Ischemic heart disease occupied 37% of total CVD burden in elderly; the prevalence of the disease was very near(35%) to that in the middle-aged population. Heart failure was almost similar in both groups (~23%). Rhematic heart disease was most common in adults (15.9%) followed by that in the middle-aged group (10.8%). Arrythmia and conduction defects scored 30.8% of the total CVD burden in adults (Table:3).

Hypertension was the most common finding at presentation, which the patients knew beforehand or was the incidental finding during physical examination (52.3% ). Around 57% of the middle-aged patients and nearly half of all elderly population(50.6%) had hypertension. Diabetes was highest among elderly patients(12.6%). Dyslipidemia that needed treatment was seen in 2.2% of the middle-aged patients, which was the highest among all age groups (Fig: 3)

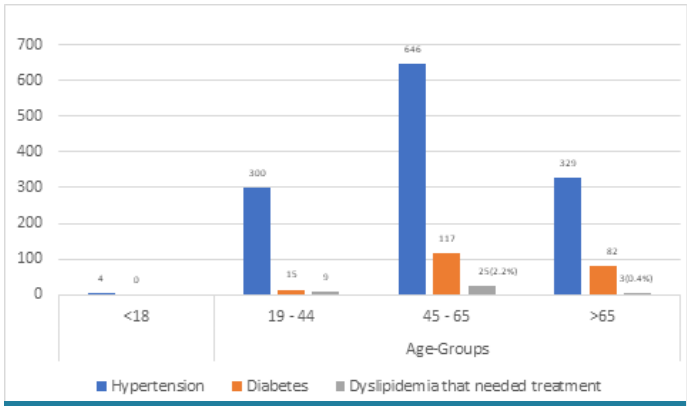


**Fig 2: Distribution of Risk factors among age groups**

A significant proportion of patients presented with non-cardiac causes (25.73%). Psychiatric illness, mostly in the form of anxiety and depression, was the most common co-morbidity among all and adults took the largest share of it (8.6%) followed by middle-aged population. COPD was the second most common co-morbidity and was predominant in the elderly patients(10%). Renal diseases ranked third in the hierarchy and was most commonly seen in adult

**Table 3.** Age Group-wise Distribution of CVDs in patient Population

| Diagnosis | Age Group | | | | Total |
|---|---|---|---|---|---|
| | </=18 | 19 - 44 | 45 - 64 | >/=65 | |
| Ischemic heart disease | | 10 | 84(35.1%) | 73(37%) | 167 |
| Pericardial Effusion | | 2 | 10 | 2 | 14 |
| Arrythmia and Conduction Defects | 1 | 29(30.8%) | 50(20.9%) | 51(25.9%) | 131 |
| Peripheral Arterial disease | | 1 | | 1 | 2 |
| Pulmonary embolism | | | 1 | 6 | 7 |
| Degenerative valvular heart disease | | | 5 | 9(4.5%) | 14 |
| Hypertrophic cardiomyopathy | | | 2 | 1 | 3 |
| Heart failure | | 19 | 56(23.4%) | 47(23.8%) | 122 |
| Congenital Heart Disease | 1 | 13(13.8%) | 4 | 1 | 19 |
| Infective Endocarditis | | | 1 | | 1 |
| Rheumatic heart Disease | 5 | 15(15.9%) | 26(10.8%) | 3 | 49 |
| Pericarditis | | 5 | | 2 | 7 |
| Myocarditis | | | | 1 | 1 |
| Total | 7 | 94 | 239 | 197 | 537 |

population (5.6%) followed by that in the middle-aged group (3%). Orthopedic cases were commonly seen in adult population (5.1%) followed by the elderly (1.8%). Multiple co-morbidities were common in the elderly patients, which accounted for 4.6% of their total population. Ischemic stroke was also higher in the elderly(2.4%) (Fig: 3). Hypothyroidism was far more common among adult females.

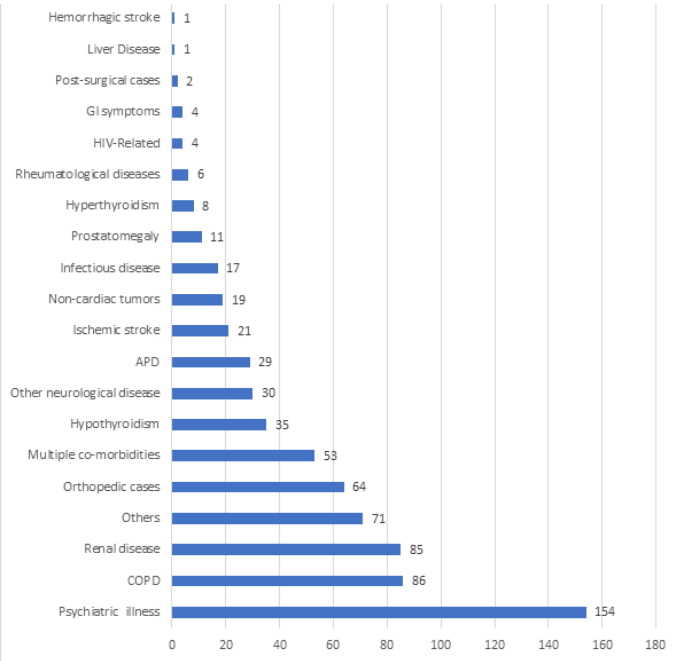


**Fig 3: Co-morbidities in patients**

Twenty five patients were referred for pre-operative evaluation and two were post-surgical cases (Fig: 4).

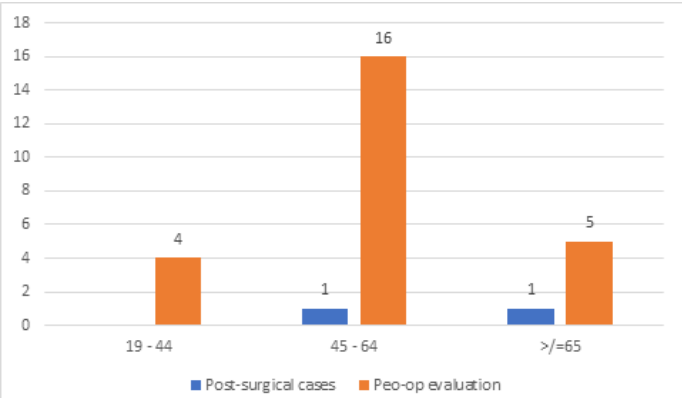


**Fig 4: Pre- and Post-op Referral in Cardiology OPD**

## Discussion

In this study, the mean age of the patients was 53.72 ± 15.69 years, and females outnumbered males slightly ( 51.5% and 48.5% respectively). Majority of the patients were from Kathmandu valley (76.28%). The most common cause of presentation was hypertension (52.3%). The findings are almost similar to an Ethiopian hospital-based study in which majority of the patients were females (65%) and living in urban areas (62.7%); hypertension accounted for the majority (62.3%) of cases[10]. In a study done in Bangladesh in OPD settings, Men and women were in almost equal proportion (48.9% vs. 51.1%) and the mean age was 51 ± 6.9 years,[11] which is similar to our study. In another study done in Iran, the prevalence of uncontrolled hypertension was 61.7% in all participants.[12] This study also shows the high prevalence of hypertension in the patient population as observed in our finding.

A significant number of patients did not have cardiac diseases. 25.73% of patients visited cardiac OPD for non-cardiac causes, which is almost half (51.1%) of the patients in a study done in Bangladesh.[13] Middle-aged patients (45 -64 years) outnumbered all in both the genders. This may be due to the increased awareness of diseases and earning capacity in this age-group. This may account for the higher number of hypertensive patients in this age group in contrast to other international studies in which hypertension prevails more in older population.[14]

Ischemic heart disease (31%), Arrythmia and conduction defects (24%), heart failure (23%) and rheumatic heart disease (4%) were the first four common diseases in our patient population. In a study done in Bangladesh in 2016, coronary artery disease(4-6%), stroke(0.3-1%) and congenital heart disease (25-30/1000 live births) were the common CVDs.[15] In another study done in India in 2016 in a tertiary care teaching hospital, Ischemic heart disease (67.06%), Cardiomyopathies (8.88%), Valvular heart disease (6.62%) and Rheumatic heart disease (3.57%) were the first four common cardiovascular diseases.[16] The prevalence and pattern of CVDs vary both within and between regions, and countries depending on factors such as genetic predisposition and environmental factors as well as availability of expertise in healthcare systems.[17]

Ischemic heart disease, degenerative valvular heart disease and heart failure were common among elderly patients. The American Heart Association (AHA) has reported that the incidence of CVD in US men and women is ~40% from 40–59 years, ~75% from 60–79 years, and ~86% in those above the age of 80.[18] This indicates that CVDs are common among elderly population as observed in our study. Congenital heart diseases were seen more commonly among adults (19– 44 years). This was similar to a study from Public Reference Hospital in Northeastern Brazil which showed that most common age-group for CHD was 21- 30 years followed by the age-group 31- 40 years.[19]

Hypothyroidism was far more common among adult females. A significantly higher proportion of older females were diagnosed with hypothyroidism in a study from India,[20] which is consistent with the finding of our study. Diabetes, multiple co-morbidities, COPD and ischemic stroke were more common in elderly. These observations resemble with the observations from a Chinese study which revealed that the frequency of stroke, IHD and COPD increased linearly with increasing age.[21]

This is a retrospective single-center based study. So, the results may not be generalized to community level. Not all the patients from community may have access to medical facilities. Merging the studies from more centers would reflect the status of cardiovascular diseases that is nearer to reality at community level.

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